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NPC

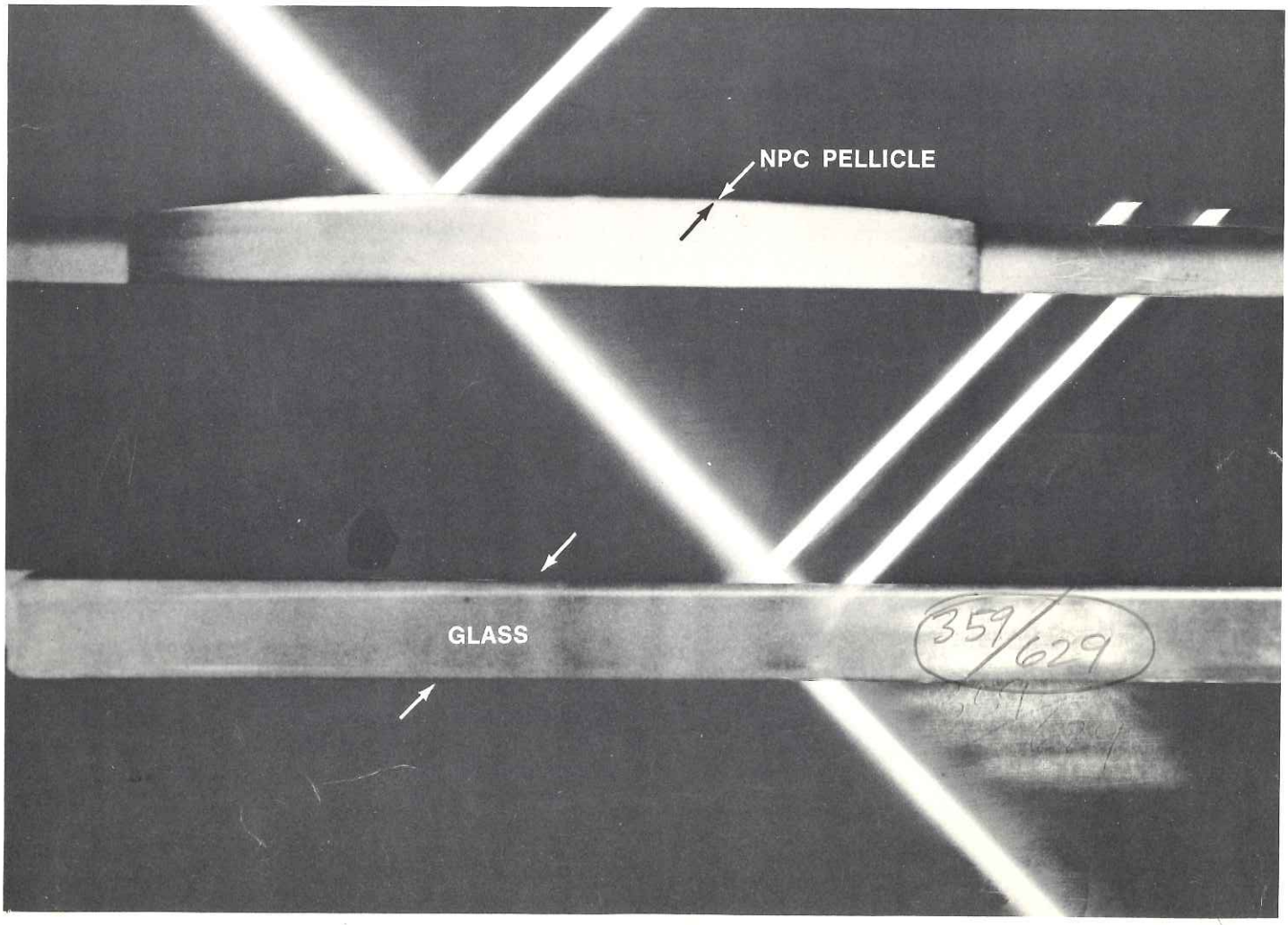
interferometer quality pellicle system

A significant new advance in precision plane pellicles . . . where high resolution is required in both transmitted and reflected beams.

National Photocolor's new high "I Q" Pellicle system represents a noteworthy step toward achieving the ideal of an "optically flat" membrane surface. In practice, the phrase "optically flat" represents the ultimate goal — perfection. This is a goal to which NPC research and development draws increasingly closer with each improvement in fabrication and components.

Since pellicles are thin, tough elastic membranes stretched over a frame, flatness of the pellicle is primarily a function of frame flatness. The pellicle membrane itself has a surface quality identical to that of the highly polished material on which it is cast. Theoretically, therefore, stretching the pellicle film over an extremely flat frame should produce the ideal optically flat surface. Ideally, frame material should be infinitely stiff. The NPC approach uses a dense alumina ceramic that has an extremely high stiffness-to-weight ratio, thus offering maximum resistance to distortion from applied stress or its own weight.

The new high "I Q" pellicles result from careful considerations of all limitations and possibilities. In design, fabrication and accuracy, they offer the highest level of pellicle flatness ever achieved! Ghost images and transmitted beam deviations do not exist, and reflected wavefronts of high fidelity are achieved. Interference effect is minimal. This makes NPC's high "I Q" pellice system ideally suited for interferometry as well as for Beam Splitting and Combining.



NPC high "I-Q" pellicle system

As shown in the illustration, the system is made up of two basic elements: A ceramic ring of high stiffness, ground and lapped optically flat, with a pellicle membrane stretched over the outer surface; and an aluminum mount that holds the pellicle ring in kinematic suspension. This imparts no distortion yet allows the pellicle to be positioned as the user wishes. Strain imposed upon the mount is not transmitted to the pellicle. This new system allows NPC to provide a pellicle of 3" I.D. flat over the central 2½" to better than ¼ λ. This flatness will be held in actual use over long periods of time despite wide variations in temperature and humidity.

When High "I Q" Pellicle Systems are ordered for use in interferometers employing a HeNe light source, NPC will supply an interferogram of the pellicle at a nominal charge of $20.00. For Beam Splitting and Combining, NPC will coat the "I Q" pellicle system to your specifications. (See NPC data sheet, "Pellicle Coatings & Curves".)

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Applications

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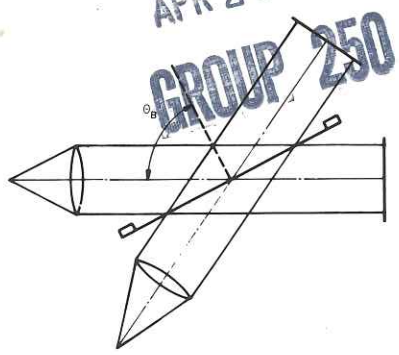

FIG. 1 Brewster Angle Interferometer

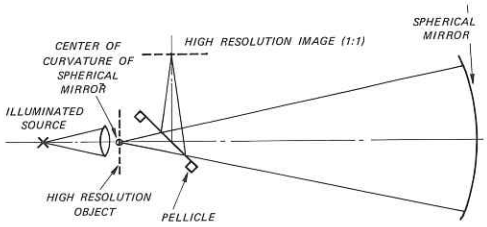

FIG. 4 High Resolution Projection Printing

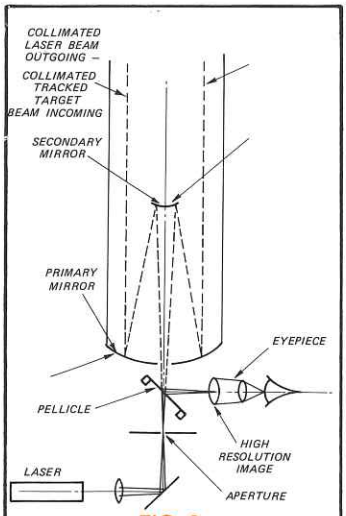

FIG. 2
Laser Tracking System

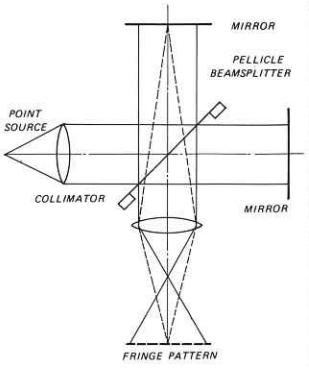

FIG. 3
Twyman — Green Two Beam Interferometer

Technical Specifications

Interferometer Quality Pellicle Systems are supplied in only one size at present, 3" I.D.

Materials of construction:	
Pellicle Ring —	High alumina ceramic
Ring Support —	Aluminum casting
Pellicle —	Highly purified, research grade nitrocellulose
Pellicle thickness —	8 μm ±10%
Planarity —	≦2 waves
Flatness —	≦¼ wave over 2½" central area
Castings available Spectral transmission	See data sheet "NPC Pellicle Castings & Curves"
Temperature range —	From —40°C to +80°C
Humidity range —	Up to 95% RH
Refractive index —	n_D 1.5
Tensile strength—PSI —	7-8000
Resistance to heat —	Ca 40°C
Dielectric Constant 10^4Hz —	6.4

National Photocolor manufactures a complete line of pellicles including: Laser and Standard grade Pellicle Beam Splitters, Stacked Plate Pellicle Polarizers, Laser Beam Samplers, Extra Thin (2 μm) Pellicles, Windows and Mirrors.

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Printed in U.S.A.